
Chapter 16

OVERVIEW OF MONITORING AND EVALUATION

A critical premise underlying the Joint Cabinet's draft Statewide Salmon Strategy (Appendix 1) and Lower Columbia Steelhead Conservation Initiative (LCSCI) is that an adaptive approach will be used to design and refine management strategies and actions, providing valid new knowledge to inform decision-making over the short and long term. An adaptive approach will purposefully implement priority conservation strategies in a manner amenable to effective evaluation. Fundamental to this premise is the need for design and implementation of an effective monitoring and evaluation plan. Such a plan will help ensure that the LCSCI is accountable, uses direction from valid new information and learning to stay on track, and is credible. The monitoring plan will be necessary to gain key insights regarding the overall efficacy of the LCSCI.

The purpose of this chapter is to clarify the monitoring and evaluation linkages to the adaptive management framework of the LCSCI. Adaptive management requires development of technically sound strategies designed to generate information to address key uncertainties and management issues. Only through scientifically based monitoring and evaluation of biotic and abiotic attributes at appropriate scales can stock status, habitat condition, and the extent to which conservation strategies achieve stated objectives be determined. It is expected that the monitoring and evaluation framework itself will evolve over time as it too is subject to the demands of an adaptive management approach.

Chapter 10 includes a description of the approach that will be used to track **implementation** of all LCSCI actions, including monitoring and evaluation actions. The approach will also include periodic review of those actions and resulting information in support of the adaptive management context of the LCSCI.

Monitoring and evaluation elements will be tailored to and integrated with specific ongoing or potential management actions. The first step has involved identifying and reviewing ongoing activities for potential integration in support of the broad monitoring needs of the conservation framework. A second phase involved completing an assessment of needs based on the results of the first step, scoping alternatives and opportunities, and finally, developing new frameworks, protocols, and experimental designs.

With few exceptions, the monitoring effort described here emphasizes activities associated with programs and projects managed by the state of Washington. Complementary efforts that are ongoing or being planned by other landowners, federal and local resource management agencies, and academic entities will be identified and incorporated as appropriate in future conservation planning steps. Continued coordination with the monitoring efforts planned by Oregon will remain a key need.

Types of Monitoring

Biophysical monitoring and evaluation needs can be organized into two general categories:

- **Status monitoring** -- This category pertains to determining and tracking the status of fish production and habitat condition. Over the short term, status monitoring produces baseline information and can reveal data gaps. Over the longer term, status monitoring will reveal trends in stock recovery or decline. Effective integration of stock and habitat status monitoring is a primary need. It will provide the context for understanding the extent to which the primary goals of conservation strategies are achieved. In general, fish production and habitat quantity or quality indices will provide data to examine key population and environmental parameters before vs. after implementation of environmental or management changes. These indices will also enable analyses of natural variation in time series data, or trend analyses (as opposed to treatment vs. control analyses). Thus, the duration of status monitoring by necessity must be long term. Again, the focus here is on development of critical priorities regarding monitoring of indices of habitat and wild steelhead stock status and to ensure that the information generated is available for informed decision-making. Development of innovative methods and protocols may be needed to enable desired monitoring. **The monitoring and evaluation goal of the LCSCI is to develop and implement an integrated and comprehensive program that effectively monitors both the biotic (biological) and abiotic (physical/chemical) aspects of the natural environment of wild steelhead in the LCSCI area, including indices of watershed/ecosystem health.**
- **Strategy effectiveness monitoring.** -- This monitoring category is intended to focus on how well specific conservation strategies achieve the intended result. In many cases, these results or objectives will be assessed at a response level or scale that is more immediate and direct than the indices of stock status assessed by long term status monitoring. Strategy evaluations will often involve fish or habitat hypothesis testing using rigorous experimental designs (e.g., treatment vs. control, replication, power analysis) of relatively short term duration. Evaluation efforts may address implementation, feasibility, or tool development issues associated with the broad range of conservation strategies.

Designation of these two categories is intended to help organize concepts and potential actions, but they are not completely distinct. For example, data generated from status monitoring will be used for strategy effectiveness evaluations, and vice versa. As a comprehensive monitoring plan continues to be developed the linkages between monitoring categories and related efficiencies will be clarified.

A description of current status and strategy effectiveness monitoring needs, opportunities, and existing activities associated with fish management (hatchery and harvest management) and habitat issues is provided in Appendix 6. All will be further developed as

the LCSCI progresses. The monitoring framework identified here should also create complementary opportunities for collection of needed stock and habitat information on salmon, coastal cutthroat trout, and other species of concern, even though the focus of the LCSCI is on steelhead.

The following elements have been identified to promote effective coordination among partners in the LCSCI monitoring program:

- Monitoring protocols - to the extent possible, entities performing monitoring activities should attempt to agree on the sampling, survey, and analytical protocols to be followed for monitoring of specific parameters.
- Quality assurance project plans - QAPPs should be required for monitoring projects.
- Reports - technical reports of progress and completion reports should be completed for all monitoring projects.
- Conferences - coordinating entities should endeavor to collaborate to host or participate in a biennial conference to share findings from LCSCI monitoring and evaluation activities.
- Data management - the utility of shared databases should be reviewed for the LCSCI to integrate monitoring data across multiple entities and species.
- Monitoring teams - habitat and fish monitoring teams or related groups would be commissioned as appropriate to facilitate the implementation and periodic revision of this plan. Each team should be broadly based and challenged to tightly coordinate with other teams and decision-makers.